Reg. No. :

Question Paper Code: 41386

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Third Semester

Information Technology

14UIT306 - ANALOG AND DIGITAL COMMUNICATIONS

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A carrier of 100W is modulated to the depth of 50% .The total transmitted power is

    (a) 112.5W   (b) 125W   (c) 150 W   (d) 100W

2. The modulation index for FM is given as

    (a) $Fm/\Delta F$ (b) $2\Delta F/Fm$ (c) $\Delta F/Fm$ (d) $\Delta F*Fm$

3. Which type of signal is represented by discrete values?

    (a) analog   (b) digital   (c) linear   (d) nonlinear

4. Costas loop is used for _____ synchronization.

    (a) Bit   (b) Carrier   (c) Frame   (d) Byte

5. _____ transmits only one bit per sample instead of N bits transmitted in PCM.

    (a) Delta modulation   (b) Digital modulation
    (c) Phase modulation   (d) Spread spectrum modulation

6. The aliasing effect can be eliminated by

    (a) using a anti aliasing filter   (b) reduce the sampling frequency
    (c) increase the modulating frequency   (d) altering the carrier frequency

7. The minimum bandwidth required to transmit the PCM signal is

   (a) 64KHZ   (b) 8 KHZ   (c) 16 KHZ   (d) 32 KHZ

8. In QPSK the phase angle for the binary 10 is

   (a) -135   (b) +135   (c) +45   (d) -45

9. The spread spectrum is a _____ in nature.

   (a) Binomial   (b) Bi-Orthogonal
   (c) Pseudo Random   (d) Auto-correlation

10. If N= 15, then the no. of flip flops for generate PN sequence is given as

    (a) 3   (b) 6   (c) 4   (d) 8

PART - B (5 x 2 = 10 Marks)

11. Sketch the frequency spectrum of AM signals.

12. Define bandwidth efficiency.

13. Define pseudo noise sequence.

14. How is the information transmitted in a PCM system?

15. Mention the significance of spread spectrum modulation.

PART - C (5 x 16 = 80 Marks)

16. (a) Derive the voltage and power equation for AMDSBFC and draw its spectrum.   (16)

Or

   (b) (i) How to generate the NBFM waves using varactor diode modulator with neat diagram.   (8)

   (ii) Explain with neat diagram of ratio detector for detection of FM waves.   (8)

17. (a) (i) Write an expression for BFSK and explain its spectrum.   (8)

   (ii) Explain QAM system with its transmitter, receiver and signal space representation.   (8)

Or

   (b) Explain the operation of QPSK transmitter and receiver.   (16)

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18. (a) (i) Describe burst error patterns in transmission channels using Gilbert modeling. (8)

(ii) Explain and neat diagram of pseudo-random number generator with an example.

(8)

Or

(b) (i) Discuss the concepts involved in switched telephone channels. (8)

(ii) Explain about light wave system model. (8)

19. (a) (i) Drive the relations for sampling rate and transmission bandwidth in PCM systems.

(8)

(ii) Write the equations for quantization noise and maximum SNR in PCM. (8)

Or

(b) (i) Explain the operation of DPCM transmitter and receiver. (8)

(ii) Explain in detail about ISI and Eye diagram. (8)

20. (a) Describe slow and fast frequency hopping. (16)

Or

(b) Explain with help of appropriate diagram of FDMA and TDMA techniques used in wireless communication. (16)

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